Patent Application of

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For

TITLE: INTEGRATED FRAMING SYSTEM

CROSS REFERENCE TO RELATED APPLICATIONS: Not applicable

FEDERALLY SPONSORED RESEARCH: Not applicable

SEQUENCE LISTING OR PROGRAM: Not applicable

BACKGROUND OF THE INVENTION – FIELD OF INVENTION

This invention relates to frame construction of buildings, specifically to the integration of the primary structural components.

BACKGROUND OF THE INVENTION

Wooden frame construction has evolved from outer walls of closely placed construction materials through three phases:

1. The use of post and beams to provide the vertical, horizontal and inclined planes necessary to support the outer construction elements which define a finished structure
2. The use of vertical members sufficient to reach the intended vertical height of the structure to which were fastened the horizontal construction elements (commonly known as balloon construction)

3. The current method of frame construction known as platform construction. Herein the joists are held in parallel by a substrata membrane upon which various wall units composed of upper and lower plates are joined to vertical studs, typically by toe nailing.

Platform construction prevents most movement of the elements but only provides minimal strength where the construction elements abut each other. Sufficient rigidity to prevent flexion is not achieved in this form of construction until all elements are joined together, lending each other a measure of support that is not inherent. The structure does not provide for stability and resistance to physical forces such as deflection until the entire structure is essentially complete.

In support of this contention that the present form of fame construction does not provide desirable levels of stability we point to the continued development work as evidenced by the patent activity. In the area of joist anchors (52/72) there are noted 248 patents which have been granted with 44 of the last 139 patents granted specifically identified as joist hangers (32%), clearly indicating the lack of acceptance of the present technology.

The same activity level is noted with the studs (52/732.2) which field has 177 patents with much current activity. Lastly in the area of joints and connections (Class 403) the stirrup connector (403/232.1) most closely identified with frame construction has 220 patents with 403/230 (rod end to traverse connection) having 580 patents. Some of the patents in these areas have metal connectors with as many as 24 spikes in one connection (5,410,854 granted to Kimmell et al, 1995). Most all of the connectors are stamped sheet metal of light weight (5,524,397 granted to Byers et al, 1996) which are not widely available to contractors and which are time-consuming to use (5,295,754 granted to Kato, 1994). Many such as 5,403,110 granted to Sammann (1995) provide only partial support with quite narrow tabs located at 90° from the main body of the bracket.

There are two patents which possess some of the desired elements of the present invention. 6,209,282 granted to LaFrance (2001) is described as a composite wood stud with two vertical outside pieces straddling a plate with grooves cut in the plate for the third vertical piece which is sandwiched in the two outside pieces. The lower portion of the composite stud straddles what is called a composite "joist" but really appears to be the lower plate of the assembly. There are many interlocking pieces in the claimed invention which is a complex, confusing assembly which does not appear to provide for fastening to a conventional floor joist, ceiling joist or rafters. The corner assembly alone (Fig. 25) has what appears to be 24 separate pieces nailed together. Fig. 20 shows a double "H" load bearing composite which does not appear to offer a very stable configuration.

Patent 1,421,299 granted to Palen (1922) has two vertical pieces straddling either side of a joist with the upper portion of these two vertical pieces attached to the roof rafter and apparently the ceiling joist but this latter attachment is not clear from the drawings. The joists rest on a plate which rests on the edge of two pieces of lumber (Fig. 2). Fig. 3 shows notched studs resting on the outer side of the outer most joist but the drawing in Fig. 3 also shows an additional two-part beam running at right angles to the joist but this beam is not identified. Patent 1,421,299 shows similar characteristics to our claim but there is no joined composite stud such as ours which has the middle piece to provide the strength and stability. In addition, the Palen invention only has studs fastened to every other joist. The construction appears to be lightweight and is done up in "frames" assembled on the ground and then raised. The inventor alludes to his embodiment as superior to "balloon frame construction."

BACKGROUND OF INVENTION – OBJECTS AND ADVANTAGES

In the embodiment of this invention, resistance to the various physical forces which work against all structures is provided by the multiple and direct connection of the vertical and horizontal elements at the most basic level – by joining each element to the other. This provides resistance to deflection and bending as well as direct support against the forces of compression.

The invention is simple to comprehend and to use. It does not require specialized equipment or products supplied by a third party vendor.

The integration of the components maximizes the strength and durability of the framing.

SUMMARY

All vertical elements of this construction are composed of the composite stud which contains two outer pieces of lumber connected to an inner piece which is of different lengths depending upon the depth of the joist below and the depth of the joist above which may receive the vertical element of the floor above.

The outer walls of the structure are comprised of the composite stud at opposing ends of the horizontal member with composite studs supporting the outer horizontal member which rests upon a plate. Interior walls may or may not be comprised of the composite stud depending on the design and other technical requirements. In the present invention the composite stud is of varying lengths depending on the height of the floors above each other as well as the distance from the inclined rafter to the ceiling joist below.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1

A: is a front view of the composite stud

B: is a perspective view of the composite stud

Figure 2 is a perspective of embodied invention in two walls of construction

Figure 3 is a perspective view of the lower portion of the composite stud as joined to the floor joist and the plate supported by the foundation.

Figure 4 is a perspective view of the upper end of the composite stud as joined to the second floor joist. The mid section of the composite stud is not shown in a number of these figures so that one can view the primary aspects of the construction.

Figure 5 is a perspective view of the composite stud where it joins the roof rafter

DRAWINGS – REFERENCE NUMERALS

10	Composite stud
10a and 10c	Outer elements of composite stud
10b	Inner element of composite stud
12	Foundation
13	Foundation plate
14	1st floor joist
15	2nd floor joist
16	Ceiling joist
17	Upper floor composite stud
18	Roof rafter composite stud
19	Roof rafters

DETAILED DESCRIPTION OF THE INVENTION

The essence of this invention is the physical joining of the supports for the horizontal and vertical planes of wooden frame construction. The primary instrument used to affect this joining is the composite stud 10 as shown in figure 1 which is engineered to straddle upper and lower floor joists as well as ceiling rafters.

The composite stud is composed of three pieces of varying sized 10a and 10c lumber which are fastened to one another with the inner piece 10b—shorter then either 10a or 10c. As seen in figure 2, the length of 10b is determined by design factors and placement within the structure. If the composite 10 is used to provide for the first floor of the structure with the lower portion of 10a or 10c would reach the plate 13 which is attached to the foundation 12. The upper portion of the composite stud 10 will occupy a sufficient portion of the upper floor joist 12 as to provide for fastening.

Upper floor composite stud 17 will be fastened to the upper floor joist 15 as well as the ceiling joist 16. Roof rafters 19 are supported by and fastened to roof composite studs 18.

In all cases the middle portion 10b is to provide support for the compression forces obtained by the positioning of the joist 14 between elements 10a and 10c of the composite stud 10. The middle portion 10b will vary depending on framing of doors or windows.

As further shown in figure 2 with the use of the composite stud the construction framing follows conventional construction techniques with sheathing providing for coverage of the horizontal and vertical planes the outermost joist 14a provides support for the placement of the composite stud 10 which then will form the exterior wall of the structure.

Figure 3 shows the detail of the foundation 12 and plate 13. The composite stud 10 as fastened to the joist 14.

Figure 4 shows the detail of the second floor joist 15 as secured and fastened by the composite stud 10.

Figure 5 shows the ceiling joist 16 the upper floor composite stud 17 all of which is integrated with and fastened to the roof rafter 19. Depending on design requirement, the roof rafter may extend beyond the composite stud to provide for an eave.

While the above detailed description of the preferred embodiment of the claimed invention it should be noted that modification, variation, and alteration of the present invention might be achieved without deviating from the scope and fair meaning of the claimed invention.